VII. Personal Protective Equipment

VII.1. Regulations

Working safely in a laboratory requires having the proper containment equipment and engineering controls, wearing appropriate Personal Protective Equipment (PPE), using proper work practices, knowing safety information for the materials and equipment used, and following safety instructions and laboratory protocols. Some labs contain more than one type or category of hazardous material. The protective equipment and work practices in such a lab are those that provide protection against the most hazardous agent.

The appropriate use of personal protective equipment (equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers) minimizes the potential for exposure to biohazard, toxic, and corrosive agents.

The Ohio Public Employment Risk Reduction Program has adopted the Occupational Safety and Health Administration standard (29 CFR 1910.132) covering the availability and use of PPE. According to the standard, the PI shall assess the workplace to determine if hazards are present, or are likely to be present, that necessitate the use of PPE. If such hazards are present, or are likely to be present, the PI shall:

- Offer the employee with the potential to exposure, types of PPE that will protect them from the hazards identified in the hazard assessment;
- Communicate the selection decisions to each employee;
- Select PPE that properly fits each employee; and
- Educate the employee on proper use of PPE.

The PI is responsible for ensuring that each person using PPE knows when PPE is necessary, what PPE is necessary, how to properly don, doff, adjust and wear the PPE, what the limitations of the PPE are, and the proper care,
maintenance, useful life and disposal of the PPE. The PI shall verify that each affected person has received and understood the required training through a written certification that contains the person’s name, the date(s) of the training, and that identifies the subject of the certification.

The PI must verify in writing that the required workplace hazard assessment has been performed by identifying the workplace evaluated, the person certifying that the assessment has been performed, and the date(s) of the hazard assessment. The document must identify itself as a certification of hazard assessment. The PPE hazard assessment should be kept as part of the Chemical Hygiene Plan.

VII.2. General Comments

Some protection is provided by ordinary clothing and glasses. However, one must dress sensibly for laboratory work. Laboratory-provided clothing protects the clothing underneath. It is the responsibility of the lab worker to use special protective clothing and equipment when they are required for safety. Protective wear may include laboratory coats, wrap around gowns, masks, coveralls, aprons, gloves, shoe covers, eye protection, and respirators. It is necessary to select the garments and fabric used based upon the nature of the hazardous agent.

The PI must provide or ensure provision of appropriate PPE to each employee who is subject to occupational exposure to human blood or other potentially biohazard material. The PPE is provided at no cost to the employee.

The PI must either directly or through delegation ensure that each employee uses PPE when warranted. Aprons, laboratory coats, gloves, and other protective clothing, preferably made of chemically inert material, shall be readily available. Laboratory coats are essential to protect street clothing from biological aerosols or chemical splashes and spills, vapors, or dusts.

PPE shall be provided in a sanitary and reliable condition and shall be cleaned regularly to avoid spreading contamination.
Protective equipment in appropriate sizes must be available in the work area or issued to employees. Hypoallergenic gloves or similar alternatives must be readily available to those allergic to the latex or vinyl gloves normally provided. Additionally, the type of glove used must be compatible with the usage: some gloves are permeable to certain compounds. Check the Safety Data Sheet for incompatibility.

PPE must be repaired or replaced as needed to maintain effectiveness.

Eyes are very vascular and can quickly absorb many chemicals. Regulations require the use of protective eye and face equipment where there is a reasonable probability that their use can prevent injury. Safety glasses with side shields are required for everyone entering the laboratory when hazardous agents are in use. Eye protection is not interchangeable among employees and shall be provided for each individual unless disinfected after use.

Safety glasses with clear side shields are adequate protection for general lab use. Goggles shall be worn when there is danger of splashing chemicals or biologicals or flying particles (such as when chemicals are poured or glassware is used under elevated or reduced pressure). A face shield (or face shield with goggles) offers maximum protection (for example, with macaque monkeys, or vacuum systems that may implode).

Corrective lenses in spectacles do not in themselves provide sufficient protection for working in the lab. Regulations require that persons whose vision requires corrective lenses, and who are required to wear eye protection, shall wear goggles over their eyeglasses, prescription safety glasses, or goggles with prescription lenses. Persons who wear contact lenses in laboratories must also wear appropriate eye protection.

Unprotected skin should be protected whenever possible. Suitable clothing shall be worn in the laboratory. Street clothing may absorb liquid spills that might otherwise contact skin. Shorts are not appropriate clothing for the laboratory. Long sleeves protect arms; long sleeves shall fit snugly when working around moving machinery. Wool affords more protection from flash burns or corrosives than cotton or synthetic fabrics. Some synthetic fabrics may increase the severity of injury in the case of fire. Cotton is less...
prone to static electricity build up than nylon or other synthetics.

The wearing of substantial leather shoes in the lab protects against chemical splashes or broken glass. The wearing of sandals or other open-toed footwear is prohibited. Cleaning up spills on floors may require extra protection such as rubber boots or plastic shoe covers. Steel-toed shoes should be used when handling heavy items such as gas cylinders or heavy equipment components.

Gloves must be worn when it is reasonably anticipated that hand contact with blood or other potentially infectious materials, mucous membranes, or non-intact skin might occur as well as when employees perform vascular-access procedures and handle or touch contaminated items or surfaces.

Disposable gloves must be replaced as soon as practical when contaminated or when torn, punctured, or otherwise compromised in their ability to function as a barrier. They must not be decontaminated for reuse.

Utility gloves (non-disposable gloves) may be decontaminated for reuse provided the integrity of the glove is not compromised. They must be discarded if cracked, peeling, torn or punctured or exhibit other signs of deterioration.

Gloves must be removed and hands washed when exposure is no longer anticipated and prior to leaving the work area.

For certain protocols and projects, additional PPE such as respiratory protection may be required. Respirator selection is based upon the hazard and the protection factor required. Personnel who require respiratory protection must contact University Health Services for medical evaluation and clearance, and Environmental Health and Safety for fit testing and training, prior to using a respirator.

Personal hygiene is extremely important to individuals working in a lab. Contamination of food, beverages, or smoking materials is a potential route of exposure to toxic chemicals or biological agents through ingestion. Laboratory personnel shall not prepare, store, or consume food or beverages, pipette by mouth, smoke, apply cosmetics, or handle contact
lenses in the lab.

Hand washing is a primary safeguard against inadvertent exposure to toxic chemicals or biological agents. Individuals should always wash their hands before leaving the lab, even if using gloves. Wash hands after removing protective clothing, before leaving the lab, and before eating, drinking, smoking, or using the restroom. Individuals should wash their hands periodically during the day at intervals dictated by the nature of the work being completed. Wash with soap and running water, with hands held downwards to flush the contaminants off the hands. Turn the tap off with a clean paper towel to prevent recontamination and dry hands with clean towels.

Confine long hair and loose clothing when in the lab to keep them from catching fire, dipping into hazards, or becoming entangled in moving machinery. Avoid the wearing of finger rings and wristwatches that may become contaminated, react with chemicals, puncture or tear gloves, or be caught in moving parts or equipment.

Remove laboratory coats and gloves before leaving the lab and entering public spaces (i.e. elevators and restrooms) to prevent spreading contamination to other areas.